BEFORE THE
PUBLIC SERVICE COMMISSION OF WISCONSIN

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Application of Milwaukee Water Works, Milwaukee County,
For Authority to Increase Water Rates                Docket No. 3720-WR-108

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**DIRECT TESTIMONY OF ERIC ROTHSTEIN**
**June 4, 2014**

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1  **Q.  Please state your name, occupation and business address.**

2  A.  My name is Eric Paul Rothstein.  I am a Utility Management Consultant.  My business

3  address is 3300 N. Lake Shore Dr., Unit 6C, Chicago, IL 60657.

4  **Q.  Please describe your educational and professional history.**

5  A.  I have a Bachelor's Degree from Ripon College, Ripon WI where I majored in Economics &

6  History.  I have a Master's Degree in Economics from the University of California, Davis

7  and completed all coursework and qualifying examinations for a PhD in economics from that

8  institution.

9  I am a Certified Public Accountant licensed by the State of Oregon.  I worked for 10

10  years for the City of Austin, Texas – for 5 years in its Resource Management Department

11  where I managed the Planning and Evaluation Division responsible for technical evaluations

12  of energy and water conservation programs.  In 1989, I became a Financial Manager for the

13  City of Austin's Water and Wastewater Utility where I had responsibility for managing cost-

14  of service ratemaking, capital financing and other financial analysis and reporting functions.

15  In 1994, I took a position with CH2M HILL – an international project delivery

16  company.  For CH2M HILL, I conducted water and wastewater rate studies, prepared

17  engineer's feasibility studies for utility revenue bond issues and participated in a variety of

18  other utility management consulting engagements.  After managing its Utility Management

Direct-Wholesale Customers-Rothstein-1

1  Solutions organization for CH2M HILL's Water Business Group, in March 2007, I left

2  CH2M HILL to form my own utility management-consulting firm marketed under a "doing

3  business as" arrangement with Debbie Galardi as the "Galardi Rothstein Group".

4  **Q.** **What other qualifications and experience do you have that makes you qualified to offer**

5  **testimony in this case?**

6  A.  I have been active in the water and wastewater industry's various professional societies

7  including the American Water Works Association (AWWA), Water Environment Federation

8  (WEF), International Water Association (IWA) and National Association of Clean Water

9  Agencies (NACWA), and I have been involved in a number of Water Research Foundation

10  (WRF - previously American Water Works Association Research Foundation AwwaRF)

11  projects.

12  I have served on AWWA's Rates and Charges Sub-Committee that is responsible for

13  promulgating AWWA's *Principles of Water Rates, Fees and Charges,* M1 manual of

14  practice, for over 20 years. During my tenure with the Rates and Charges Committee, I

15  chaired task forces that developed the *Water Rates Structures and Pricing* manual of practice

16  that was a precursor manual to sections of the M1 Manual dealing with rate design issues.

17  Recently I chaired a task force that developed revisions to the M1 Manual chapters dealing

18  with outside-City and wholesale rates chapters that was published in 2012 in the 6th edition

19  of the AWWA M1 Manual. Also for that publication, I co-authored revisions to Appendix

20  A: "Development of Peaking Factors by Customer Class."

21  In 2011, for the Halifax Regional Water Commission (HRWC), I developed (in

22  collaboration with G. A Isenor Limited and W. H. Gates Utility Consultants Limited) a Cost-

23  of-Service and Rate Design Methodology Review and Recommendations report that

24  proposed standard practices for the development of cost-of-service based water, wastewater

| 1 | | and stormwater rates.  This report was required by order of the Nova Scotia Utility and |
|---|---|---|
| 2 | | Review Board (NSUARB-W-HRWC-R-11) for its future consideration of HRWC rate |
| 3 | | applications.  HRWC is the first combined and regulated water, wastewater and stormwater |
| 4 | | utility in Canada. |
| 5 | | For the Water Research Foundation, I have been on research project teams that have |
| 6 | | addressed evaluation of Public Private Partnerships (PPP) options, asset management, capital |
| 7 | | project prioritization, and water conservation program evaluation.  For NACWA, I have |
| 8 | | prepared white papers on Financial Capability Assessment methods used to structure |
| 9 | | wastewater Consent Decrees.  For WEF's Utility Management Committee I served as Task |
| 10 | | Force Chair for development of WEF's *Financing and Charges for Wastewater Systems* |
| 11 | | manual of practice (No. 27) (2005) that promulgates standard practices for wastewater |
| 12 | | service ratemaking. |
| 13 | **Q.** | **Have the intervening wholesale customers authorized you to provide testimony on their** |
| 14 | | **behalf?** |
| 15 | A. | Yes. |
| 16 | **Q.** | **Have you reviewed the Customer Demand Study prepared for the Milwaukee Water** |
| 17 | | **Works (MWW) by Trilogy Consulting, LLC (Trilogy), dated April 2014 (PSC REF#:** |
| 18 | | **204119)?** |
| 19 | A. | Yes. |
| 20 | **Q.** | **Have you also reviewed the revised rate application (PSC REF#:  205543) and revised** |
| 21 | | **cost of service study (COSS) (PSC REF#:  205539) submitted by Milwaukee Water** |
| 22 | | **Works in this proceeding?** |
| 23 | A. | Yes. |
| 24 | **Q.** | **What is the purpose of your testimony?** |

1  A.  With respect to MWW's Demand Study, I will address the weaknesses in the Study and why

2      it should not be used as a basis for revising customer class demand factors. With respect to

3      the COSS, I will discuss why MWW's allocation of transmission and distribution system

4      costs on the basis of an approximation, rather than actual financial information, is

5      inappropriate. I will also address why MWW's proposed rate of return is too high given

6      MWW's capital structure and the level of risk posed by MWW's wholesale customers.

7      Finally, I will address common industry practices related to the allocation of public fire

8      protection to wholesale customers.

9                                          **Demand Factors**

10  **Q.  Why shouldn't MWW's Demand Study be used to revise customer class demand**

11      **factors?**

12  A.  The Demand Study is based on incomplete data and assumptions. Sample sizes are too small

13      and are not representative. The sample period for retail customers is too short and fails to

14      cover peak demand periods in 2012. The monitoring information obtained is not comparable

15      across different customer classes, and should not be used to compare relative demands of

16      different customer groups. Monitoring information for wholesale customers is based heavily

17      on 2012 -- an anomalous year for high water usage -- while monitoring information for retail

18      customers does not include information on peak demand periods for 2012. Overall, these

19      acute deficiencies in the data, and the acceptance of a variety of dubious assumptions,

20      compromise the "analysis" purportedly contained in this Study. The Study, as it is now,

21      consists of little more than a data-cloaked fiction that would – and presumably is intended to

22      -- impose a profound and unwarranted shift of costs from the retail customers to the

23      wholesale customers.

| 1 | **Q.** | **What problems in the Demand Study do you see with regard to MWW's residential** |
| 2 | | **retail customers?** |
| 3 | A. | The Study sampled only a tiny percentage of MWW's residential retail customers. At most, |
| 4 | | 185 customers out of 144,000 of MWW's residential retail customers (or less than 0.13%) |
| 5 | | were subject to some limited monitoring. But even this tiny sample was not monitored |
| 6 | | consistently. Instead, samples were taken over three different abbreviated time periods that |
| 7 | | entirely missed peak period usage in 2012 and missed several months in 2013. As the |
| 8 | | Report indicates: |

> 9  *...the first sample period ran from October 10 to November 5, 2012 and*
> 10 *included 99 residential customers. The second sample period ran from April*
> 11 *7 to May 13, 2013 and included 101 residential customers. The third sample*
> 12 *period was between July 14 and August 8, 2013 and contained 185*
> 13 *residential customers.* (PSC REF#: 204119, p. 71)

| 14 | | Trilogy took this limited data set and proceeded to calculate and cite a host of |
| 15 | | demand statistics related to these residential samples. Yet, none of these statistics either |
| 16 | | individually or collectively can be held to be representative of the residential class. |
| 17 | | Simply put, it is unreasonable to assume that the residential retail class' peak demand |
| 18 | | patterns during the missed time periods would mimic those time periods that happened to be |
| 19 | | monitored. The very nature of peak demand is that it is highly variable (both daily and even |
| 20 | | more so hourly) and the point of demand monitoring is to capture this variability. The fact |
| 21 | | that MWW failed to monitor the residential retail class consistently and over peak periods is |
| 22 | | alone sufficient basis to discard the resultant imputed retail demand factors as unreliable. |
| 23 | **Q.** | **Do the same problems with sampling periods exist with regard to MWW's non-** |
| 24 | | **residential retail customers in the Demand Study?** |

1 A. Yes. For all of the retail customer classes, the demand monitoring periods are sporadic, miss

2 key peak demand periods and therefore compromise the extent to which inferences may be

3 drawn. Trilogy acknowledges as much in its discussion of Data Limitations:

4 *Sampling Period Dates - Because of difficulties receiving the meters from*
5 *suppliers and receiving specific instructions on how to collect data from the*
6 *meters, the timeframe for two of the three sample periods was not the season*
7 *when the peak day and hour were expected to occur. This is especially true*
8 *for the residential and commercial customer classes.* (PSC REF#: 204119,
9 p. 67)

10 Trilogy also notes that:
11
12 *Because of limitations on the amount of data that each meter can store before*
13 *it can be downloaded and reset (each meter could only store 40 day's worth*
14 *of data) the sample data is staggered so that on any particular day,* ***some***
15 ***meters might not have recorded that day's usage.*** *(emphasis added)* (PSC
16 REF#: 204119, p. 67)

17 There is also a problem with sample size for the different non-residential retail customer

18 classes, and with inconsistency in the populations sampled across metering periods.

19 **Q. What problems in the Demand Study do you see with regard to the sample size for**

20 **MWW's non-residential retail customers?**

21 A. For commercial customers, Trilogy provides a lengthy soliloquy about the use of different

22 mixes of small and large commercial users, then states:

23 *As long as the mix of customers within the sample is appropriate, the analysis*
24 *appears to show that a sample size of slightly less than 200 should be*
25 *sufficient to provide good data.* (PSC REF#: 204119, p. 31)

26 The Study, however, uses less than half that sample size for commercial retail customers

27 across all three of its sampling periods. Ninety meters were read during the third sampling

28 period, while only 71 meters were read during MWW's first sampling period and 72 meters

29 during the second sampling period. (PSC REF#: 204119, Tables 21-23, pp. 69-70)

1        For the industrial class, Trilogy noted that 51 meters (out of approximately 1400)

2     were responsible for 78 percent of class usage, suggesting that the inclusion or exclusion of

3     any collection of a relative few (or even one or two) of these customers could materially

4     impact the demand factors derived for this class.  (PSC REF#:  204119, Tables 21-23, pp.

5     69-70)  Yet, for 2 of the 3 sampling periods, less than 25% of these meters were monitored.

6     Overall, for the industrial class, only 11 meters, 12 meters and 35 meters were read during

7     the three different abbreviated sampling periods.  (PSC REF#:  204119, Tables 21-23, pp.

8     69-70)

9        For the public authority class, like the industrial class, the sample size is less than 3%

10    of the population of all meters. During the three different sampling periods, 18, 8 and 26

11    meters were read respectively. (PSC REF#:  205539, Schedule 10 and PSC REF#:  204119,

12    p. Tables 21-23, pp. 69-70).  Trilogy noted that because larger customers in this class both

13    "tend to exhibit similar peak quarter-to-average consumption ratios as compared to the

14    remainder of the customers"  (PSC REF#:  204119, p. 32) and account for almost half of the

15    classes' consumption, it was determined to sample as many as possible of the 17 large

16    volume customers with meters capable of higher resolution (e.g. daily and hourly)

17    monitoring.  (PSC REF#:  204119, p. 32)  While this may be an understandable coping

18    strategy for equipment limitations, it does not overcome the problem that sample sizes of

19    between 8 and 26 meters, and limited insights based on peak quarter-to-average data, may

20    not accurately reflect the fact that as Trilogy notes: *"[p]ublic authority customers exhibited*

21    *varying patterns of consumption."* (PSC REF#:  204119, p. 32)

22 **Q.    Setting the sample size limitations aside, please discuss the other methodological**

23    **problems with the Study's development of retail class demand factors.**

1    A.    As I noted above, the Study also suffers from numerous dubious assumptions. Among these,

2          perhaps the most problematic is stated as follows:

> 3    *An important assumption that the analysis makes is that peak usage ratios*
> 4    *within any given period during the year (month or quarter) are fairly*
> 5    *constant compared to the peak ratios within any other period. Assuming this*
> 6    *is true, the sample data can be used as the basis for the first part of the*
> 7    *equation; that is, the MD:AD for the sample period can be used to*
> 8    *approximate the MD:AD ratio during the Maximum Period for the year.*
> 9    (PSC REF#: 204119, p. 93)

10        This assumption is unwarranted, counter-intuitive and arguably simply a ridiculous

11        overreach to cope with crippling data limitations. As seems amply demonstrated by the

12        plethora of charts throughout the Demand Study, there is considerable variation in exhibited

13        class demands across quarters, seasons and years. Yet, the Study asks the reader to believe

14        that the relationship between peak and average demands across a spattering of sampling

15        periods will magically walk in lock step with the Maximum Period for the year. Moreover,

16        the Study asks the reader to set aside what would seem a more intuitive conclusion – that

17        peak to average demands are higher than other periods when the system is peaking. There is

18        simply no logical or rational basis for making the assumption proposed by the Demand

19        Study. It seems obvious that the only reason the Demand Study proposes this assumption is

20        to justify its derivation of class demand factors from fundamentally inadequate data sets.

21    **Q.    Are there other methodological problems with the Demand Study's development of**

22        **retail class demand factors?**

23    A.    Yes. The Study fundamentally fails to appreciate the need to draw data from the same time

24        periods when attempting to represent temporal variability in demands across customer

25        populations. Colloquially, it is important to make apples to apples comparisons. The

26        Demand Study employs a virtual fruit basket – combining data in different ways and over

27        different time periods.

1          In the Demand Study, residential retail demand factors are based on the highest of the

2     three sampled ratios; non-residential retail factors are based on the average of the samples;

3     seasonal peaking histories (used to impute a seasonal adjustment factor) are drawn from the

4     last two years for the residential class, and from a 7-year rolling average for non-residential

5     classes.  As the Study indicates:

6          *Since more than one ratio was calculated for each, the average of the three*
7          *calculated ratios was used as the basis for further analysis, with the exception*
8          *of the residential class, which used the highest of the three ratios. The*
9          *seasonal peaks (i.e. peak quarter to average day) are taken from the analysis*
10         *of the historical billing data. The commercial, industrial and public authority*
11         *classes' seasonal peaking factors were based on the 7-year rolling average of*
12         *peak month to average month, as shown in Table 26. The seasonal peaking*
13         *factor used for the residential class is based on the overall system pumpage*
14         *ratio of the average day during the max month to the average day for the year*
15         *over the last two years.*  (PSC REF#:  204119, p. 93)

16         The Study's approach of using this information from different time periods -- despite

17    potentially profound differences in demand patterns across these different time periods -- to

18    derive factors that are then used to represent the inter-relationships between class demands

19    over a <u>common</u> time period is fundamentally flawed.

20    **Q.   Do these problems apply to both the max-day and max-hour retail class demand factors**

21         **proposed in the Study?**

22    A.   Yes.  All of the problems enumerated above pertain to both the max-day and max-hour

23         factors because they arise from problems with the basic sampling (e.g., inadequate sample

24         sizes) and assumptions about relationships between the sampling period demands and peak

25         period demands.

26    **Q.   Are there any other problems with the max-hour retail class demand factors proposed**

27         **in the Study?**

1   A.   Yes. One of the purposes of a demand study is to obtain hourly customer demand metering

2       over peak periods. The Demand Study fails to do that for retail customers. Instead the Study

3       proposes to preserve the estimating assumption relationship between max-day and max-hour

4       that hourly customer demand metering (over peak periods) is intended to overcome. As the

5       Study states:

6                 *Because there are no data for any seasonal characteristics for peak hourly*
7                 *usage, the same seasonal factors as those used for the MD:AD ratio*
8                 *calculations were used to calculate reasonable MH:AD ratios for each*
9                 *customer class. This assumes that the relationship between the maximum*
10               *hour usage and the maximum daily usage remains consistent throughout the*
11               *year, a common assumption in determining peaking factors.* (PSC REF#:
12               204119, p. 93)

13       While it may be true that, in the absence of metering data, class hourly demand factors are

14       commonly estimated by applying max-day to average day relationships, this is a coping

15       strategy. It is an assumption made in the absence of data. The whole point of demand

16       metering is to avoid having to make such assumptions and use actual, observed demand

17       measures. The Demand Study fails to accomplish its purpose of providing actual

18       information to support the revision of customer demand factors.

19   **Q.**   **The Demand Study does report demand data from the wholesale customers over a**

20       **longer period of time. Why shouldn't demand factors based upon this data be used in**

21       **this case?**

22   A.   These factors, based on data from portions of 2012 and 2013, are not representative. As

23       Patrick Planton's testimony documents, 2012 was an exceptional weather year with respect

24       to both temperature and precipitation. However, the Demand Study fails to recognize the

25       fundamental problems with heavy reliance on data from this anomalous period and instead

26       employs a strangled and illogical adjustment procedure that confounds and exacerbates the

27       problems. The fundamentally flawed procedure is outlined below:

1          *If enough data were available, a simple average of all of the calculated*
2          *previous 12 months ratios would be sufficient to determine each customer's*
3          *average peak demand ratios. However, a simple average would not work*
4          *with the number of data points in this analysis because the uneven number of*
5          *points based on the 2012 peak event(s) versus the 2013 peak event(s) would*
6          *skew the calculated number either high or low. To correct for this, the*
7          *analysis first averages the group of peak ratios associated with each distinct*
8          *peak event and then calculates the average of all of the distinct peak events.*
9          (PSC REF#: 204119, p. 54)

10         First, one has to scratch one's head at the statement that a calculation of the previous 12

11         months ratios would be "sufficient to determine each customer's average peak demand

12         ratios." This preserves the dubious logic that peaking characteristics experienced at different

13         times throughout the year are indicative of Maximum Period peaking but more importantly,

14         misses the point entirely. The major problem is not that there are data gaps in 2012 and 2013

15         demand measures – which are symptomatic of other deficiencies - but that 2012 in particular

16         is an exceptional year. Using an averaging of demand measures from it, whether derived

17         from greater or fewer demand readings from particular days, as one of **only two** data points

18         used to calculate wholesale class demand factors is effectively worse than if the Demand

19         Study would have discarded the 2012 data entirely.

20   Q.    **How could inclusion of metered wholesale demands be less representative of customer**

21         **demands?**

22   A.    This is a classic example of "the flaw of averages" – and also explains phenomenon like why

23         people drown in bathtubs though they are filled, "on average," to only a few inches of water

24         depth. A simple arithmetic example can illustrate. Say a wholesale customer's max-day

25         demands ratios over a 10-year period are: 1.5 for each of the first 7 years, 1.0 in the 8th year,

26         2.0 in the 9th year, and return to 1.5 in the final year. It is obvious that the typical demand

27         factor for this customer is 1.5, which is the average of the 10-year period (or would be the

1    average of the preceding 4-year period for that matter).  However, if one only averages the

2    9th and 10th year, the calculated peaking factor is 1.75.

3    For all intents and purposes, 2012 was like the 9th year in this example – and

4    obviously so by inspection of the dozens of charts provided in the Demand Study.  This is

5    why the inclusion of actual 2012 data for the wholesale customers (and the convenient

6    exclusion of the same 2012 data for retail classes) is actually worse than if the data was

7    discarded entirely.  (In the simplified example, if the anomalous 8th & 9th years were

8    discarded, one would have the correct demand factor derived).

9    **Q.    Do you have other concerns with the Demand Study's development of wholesale**

10    **demand factors other than its use of 2012 data?**

11    A.    Yes.  While MWW collected data for many of the wholesale customers, MWW failed to

12    collect data from two wholesale customers.  MWW then proposed remedies for this lack of

13    data that reinforced the disadvantaging of the Wholesale Customer group to the benefit of

14    retail customers.

15    Though the Demand Study fills data gaps by assuming average demands over

16    unrecorded periods and notes:

17    *If anything, it is possible that during these times, there could have been a*
18    *peak day of consumption that was not recorded. However, because of the*
19    *data, the analysis must assume stable usage for these meters during these*
20    *periods and only consider recorded peaks in performing the calculations of*
21    *peak ratios.*  (PSC REF#:  204119, p. 34)
22
23    It is noteworthy that the cures for the failure to collect **any** demand readings for Shorewood

24    and Milwaukee County are not so innocuous.  The Study states:

25    *Milwaukee County Grounds consists of large commercial users, so it is*
26    *reasonable and logical to assume that their demand patterns are most similar*
27    *to those of Milwaukee's commercial urban retail customer class.*
28

1         *Shorewood also does not appear to have extreme demand patterns in terms of*
2         *either volume or variability. This leads to the conclusion that an average of*
3         *the other wholesale customers' factors is appropriate.* (PSC REF#: 204119,
4         pp. 62-63)
5

6         In the case of the Milwaukee County Grounds accommodation, the assumption is not to

7         assign system demand ratios – so as not to unduly inflate any customer classes' relative

8         responsibilities for peak period demands - nor even the wholesale class average (as done for

9         Shorewood), but rather to assign the factors assigned to urban commercial customers

10        (dubiously developed as discussed previously).  Keeping in mind that the customer class

11        revenue responsibilities are a function of **relative shares** of peak period demands, this action

12        indefensibly shifts cost responsibilities to the wholesale customer group (that does not

13        include the Milwaukee County Grounds).

14            Notably, even the less offensive assumption used for Shorewood of applying the

15        average of demand factors assigned to other wholesale customers (excepting, of course, the

16        Milwaukee County Grounds) serves to shift costs to the wholesale customer group.  This is

17        also because of the "zero-sum" calculus of peak period cost allocation and the undue

18        inflation of the demand metered wholesale customers (using 2012 and 2013 absent

19        meaningful adjustment for 2012 weather conditions).  In short, the demand factor assignment

20        to Shorewood is too high because all the metered wholesale customers demand factors are

21        too high, with the effect of adding to the wholesale customer groups' share of peak period

22        demands to the benefit of retail users.

23 **Q.**   **Do you have other general concerns with the Demand Study?**

24 A.    Yes.  While it is clear that the Demand Study does not provide a reasonable basis for revision

25        of the customer class demand factors in this case, there are also a sufficient number of

26        methodological failings to compromise it serving as a foundation for future development of

| 1 | | class demand factors. These methodological failings range from strained inferences drawn |
|---|---|---|
| 2 | | from peak period to average quarterly demands to the misconstruction of terms related to |
| 3 | | coincident and non-coincident demand characteristics. While these problems need not be |
| 4 | | delineated here, it is important to note that an adequate demand study will require |
| 5 | | fundamental reformulation to serve as an adequate basis for determination of customer class |
| 6 | | demand factors. In the event that MWW elects to conduct a new study for future rate cases, |
| 7 | | it would behoove all parties to ensure adequate program implementation and data analyses |
| 8 | | are conducted well in advance of the submission of this information in the context of a |
| 9 | | contested rate case. |
| 10 | **Q.** | **What customer class factors do you believe should be used for MWW's customers in** |
| 11 | | **this rate case?** |
| 12 | A. | MWW has failed to provide a reasonable rationale for revising either retail or wholesale |
| 13 | | customer demand factors, therefore it would be reasonable for the Commission to |
| 14 | | continue using the customer demand factors that were used in prior PSC rate decisions. |
| 15 | | This would be consistent with the Commission's decision in MWW's 2010 rate case |
| 16 | | where it stated: |

> *There is insufficient information in the record to support a revision of*
> *customer class maximum hour demand ratios in this case. These ratios*
> *may be revised in a future rate case if data is collected to support a*
> *revision.* (PSC REF#: 144469, p. 3)

| 21 | **Q.** | **Does this conclude your testimony on the Customer Demand Study?** |
|---|---|---|
| 22 | A. | Yes. |

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**Transmission and Distribution Allocation**

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| 24 | **Q.** | **Turning to your next area of testimony, what are your concerns with the allocation of** |
|---|---|---|
| 25 | | **transmission and distribution asset values?** |

1    A.    MWW has collected and maintained information on the actual costs of mains and valves of

2          various sizes. (PSC REF#: 204429, Supporting Schedule -T&D Main Analysis) Using

3          MWW's definition of transmission mains and valves as those 16-inches or larger, they

4          calculate the actual cost of transmission assets to be 29.75 percent of transmission and

5          distribution system. Yet in their COSS, they effectively abandon the use of actual, historical

6          data in favor of an estimation procedure *commonly employed in the absence of available*

7          *historical data.* This estimation procedure calculates the proportionate shares of diameter-

8          inch miles of transmission and distribution lines and applies these percentages to the total

9          costs of transmission and distribution related assets.

10    **Q.    Why is MWW's use of the diameter-inch mile share procedure problematic?**

11    A.    First, it eschews accuracy in favor of approximation. This alone is counter to industry-

12          standard practice and the intent of the cost allocation process that seeks to distribute cost

13          responsibilities on the basis of cost causation. Second, it has disproportionate (and

14          inappropriate) impacts across customer classes – resulting in greater allocation of cost

15          responsibility to wholesale users to the benefit of the retail classes.

16    **Q    Was this issue addressed in the 2010 rate case?**

17    A.    Yes. MWW's 2014 proposal is a departure from the Commission's decision in the previous

18          MWW contested rate case, Docket 3720-WR-107. In that docket, the Commission used

19          MWW's actual cost data to allocate transmission vs. distribution main costs. This actual

20          data existed in MWW's 2010 rate case and continues to be available. MWW's resurrection

21          of its diameter-weighted length proposal in 2014 seems a cynical attempt to throw more

22          costs on MWW's wholesale users using procedures the PSC has already found lacking.

23    **Q.    Does this conclude your testimony on the allocation of transmission and distribution**

24          **related costs?**

1   A.    Yes. However, my testimony is supplemented and supported by that of Patrick Planton who

2        provides specific information on the magnitude of cost shifting that is occasioned by

3        MWW's misallocation of transmission and distribution costs. I would simply close this

4        discussion by citing the most recent edition of AWWA's M1 manual of practice, *Principles*

5        *of Water Rates, Fees and Charges* (6th Edition) (hereafter "AWWA M1 Manual"),

6        specifically the new chapter on Outside-City and Wholesale Rates where this issue is

7        addressed:

8                *Given information on pipelines that serve transmission versus distribution*
9                *functions, the associated costs of these assets may be ascertained from the*
10               *fixed asset records of the utility (if these records distinguish asset costs by*
11               *pipe size). Alternatively, the proportionate shares of diameter-weighted*
12               *lengths of pipelines\* may be used* **to estimate** *(and allocate to customer*
13               *classes) the capital and O&M costs associated with the transmission systems*
14               *compared to the entire transmission and distribution system. However, care*
15               *also needs to be taken in using this method because the diameter and the*
16               *value of the mains may not have a direct relationship in that the age and net*
17               *book value of the assets may vary significantly by size. (emphasis*
18               *added)*(AWWA M1 Manual, p. 168)

19        MWW has fixed asset information by pipe size. It should use it.

20                                        **Rate of Return**

21   Q.    **Turning now to the allowed rate of return, at the beginning of your testimony, you**

22        **stated that MWW's proposed rate of return is too high given MWW's capital**

23        **structure. Is MWW's capital structure unusual?**

24   A.    Yes. According to MWW's debt summary (PSC REF#: 205543, Attach 15 & 21), MWW's

25        capital structure estimated for the end of 2013 is approximately 88.66 percent municipal

26        equity and 11.33 percent long-term debt – with the inclusion of $5.34 million of new debt

27        issued in 2013 (PSC REF#: 201694). The result is a debt/equity ratio for MWW that is

28        exceptionally low, and atypical relative to most other major Wisconsin water utilities and

29        relative to most major metropolitan water utilities. This is graphically demonstrated by Ex.-

1    Wholesale Customers-Rothstein-1, page 1, which is based on data from Wisconsin PSC

2    Annual Report submittals that provides the ratio of Long-Term Debt to the sum of Long-

3    Term Debt and Proprietary Capital Earnings for Class AB Water Utilities in Wisconsin with

4    Total Proprietary Capital in excess of $50 million.  (See Ex.-Wholesale Customers-

5    Rothstein-1, pages 2 - 5 for supporting data and calculations.)  This Exhibit shows that

6    Milwaukee holds exceptionally low debt per dollar of proprietary capital relative to other

7    major Wisconsin utilities.   The Wisconsin PSC's 2013 Water Statewide Statistical

8    Benchmark report that shows that the average debt/equity ratio across Class AB water

9    utilities was 34%; the median was 32%.  Milwaukee's debt/equity ratio is roughly $1/3^{rd}$ of

10   comparable Wisconsin water utilities.

11          Among surveyed major metropolitan water utilities throughout the country, MWW

12   has among the very lowest debt to equity ratios.  (Ex.-Wholesale Customers-Rothstein-2,

13   based on 2012 AWWA/RFC Water and Wastewater Rate Survey data)  MWW's atypical

14   debt/equity ratio reflects MWW's primary use of equity financing of capital (and

15   contributions in aid of construction CIAC) to develop its rate base.

16  **Q.   Why should MWW's capital structure be considered in determining the allowed rate of**

17        **return?**

18  **A.**   Because the amount of money that will accrue to the City of Milwaukee varies dramatically

19        depending on the capital structure.  By way of a simplified illustration, assume that an

20        allowed rate of return of 5% was set such that the return on municipal equity (5%) was equal

21        to the cost of debt (5%). Now, if a $300 million dollar net investment in rate base is

22        comprised of 10% debt and 90% equity, the owning municipality receives $13.5 million, and

23        pays $1.5 million in debt-related costs.  If the municipality has a more typical debt / equity

24        capital structure, say 50%/50%, the amount accruing to the municipality is $7.5 million with

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| 1 | | an equal amount required for debt-related costs. The same allowed rate of return results in |
| 2 | | dramatically different benefits accruing to the owning municipality depending on capital |
| 3 | | structure. |
| 4 | **Q.** | **Should the PSC alter its "capital structure neutral" practice of setting the return on net** |
| 5 | | **investment rate base (NIRB) based on the cost of 30-year municipal debt plus 2 percent** |
| 6 | | **for this case?** |
| 7 | A. | Yes. While PSC practice with respect to its allowed rates of return may be "capital structure |
| 8 | | neutral" for typical cases, it would be inappropriate to ignore the implications of MWW's |
| 9 | | atypical capital structure when setting the rate of return in this case. As shown by the |
| 10 | | illustrative example above, and the facts specific to this case, capital structure matters. |
| 11 | | Without recognizing the implications of capital structure, the PSC may be misled by |
| 12 | | MWW's seemingly reasonable composite rate of return request which is below the PSC |
| 13 | | benchmark rates. Yet, it is important to recognize that the resulting absolute dollar value of |
| 14 | | MWW's requested return of 5.38% under these circumstances will be approximately $18.07 |
| 15 | | million or approximately 20% of MWW's total revenue requirements. In that only |
| 16 | | approximately $1.4 million is estimated 2014 annual interest expense on MWW's |
| 17 | | outstanding debt (due to MWW's atypical capital structure), the requested return will yield |
| 18 | | over $16.7 million in return on equity (PSC REF #: 205539, Schedule 2; PSC REF # |
| 19 | | 205543, Attach 15 and NIRB sheets). This amount of absolute dollar inflow to the City of |
| 20 | | Milwaukee as the owner of the utility system gives pause when it is further recognized that |
| 21 | | the City is the recipient of a Net Property Tax Equivalent (PILOT) payment in excess of $12 |
| 22 | | million (PSC REF #: 205543, Attach 8). |
| 23 | **Q.** | **What adjustment would you propose to address MWW's atypical capital structure?** |

1  A.  A relatively simple calculation may be used to impute a rate of return that provides for an

2     appropriate return on equity, in absolute dollar terms, while recognizing MWW's atypical

3     capital structure.

4        Specifically, if one were to assume that MWW's capital structure was 50 percent

5     equity and 50 percent debt, and one adopts (without conceding the merit of) MWW's and

6     PSC's proposed 5.38 percent unadjusted rate of return,  $9.04 million in absolute dollars

7     would be allowed as return on equity. [$336,130,621 NIRB * 50% equity *5.38% rate of

8     return]  One may then impute an allowed rate of return of 3.11% given MWW's approximate

9     90 percent equity / 10 percent capital structure.  [($9.04 million Return on Equity + $1.4

10    million Cost of Debt) /$336 million NIRB = 3.11% Imputed Rate of Return].

11       This proposed approach would provide MWW with a return on equity in absolute

12    dollar terms that is consistent with that which would be granted other major Wisconsin

13    utilities that have more appropriately balanced capital structures.  It would also provide

14    MWW adequate returns while not inappropriately rewarding it for its imbalanced capital

15    structure.

16  Q.  **How can an allowed rate of return based on an assumed capital structure be**

17     **reasonable?**

18  A.  The proposed use of an assumed capital structure is recognized by the AWWA M1 Manual,

19     *Principles of Water Rates, Fees and Charges* (6th Edition), as a method to determine a fair

20     rate of return in situations where the capital structure of a water utility has excessive amounts

21     of equity.  The AWWA M1 Manual states:

22        *Sometimes the actual capital structure of a water utility may have excessive*
23        *amounts of debt or equity.  In such cases, an alternative capital structure is*
24        *used to determine a fair rate of return. …In other situations, regulatory*
25        *agencies have imputed a hypothetical capital structure based on an*

| 1 | | *examination of similar companies or industries.* (AWWA M1 Manual, p. 47- |
| 2 | | 48) |

3    As Ex.-Wholesale Customers-Rothstein-1 and Ex.-Wholesale Customers-Rothstein-2

4    demonstrate, MWW's capital structure is clearly atypical and reflects "excessive amounts of

5    equity" such that use of an alternative capital structure is appropriate.

6  **Q.    Is the assumed 50 percent equity, 50 percent debt capital structure reasonable?**

7  A.    The 50 percent debt, 50 percent equity structure used to impute my proposed rate of return is

8    clearly reasonable.  It is the capital structure employed in the numerical example used in the

9    AWWA M1 Manual. The PSC Reference Manual also states:

10    *"A municipal capital structure is generally considered to be favorable if it*
11    *has at least 50 percent earning equity and less than 50 percent debt"* (Public
12    Service Commission's Water Utility Reference Manual, Chapter VI, "Other
13    Balance Sheet Issues", p. 1 of 5).

14    Notably, some of the larger Wisconsin utilities (Appleton, Madison, Oshkosh, Racine) (Ex.-

15    Wholesale Customers-Rothstein-1) are even more debt-burdened as are numerous major

16    metropolitan water utilities across the country.

17  **Q.    Do you propose any other adjustments when imputing your proposed rate of return?**

18  A.    Yes. MWW's proposed revenue requirements reflect continuing under-investment in asset

19    renewal and rehabilitation while preserving its imbalanced capital structure.  As a result, I

20    propose adjusting the cost of debt to facilitate increasing MWW's bonded indebtedness.

21    Specifically, I have assumed that MWW will incur an additional $25 million in 30-year

22    revenue bonded indebtedness to fund additional asset renewal and rehabilitation, occasioning

23    additional debt service requirements of approximately $1.5 million per annum (assuming

24    new 30-year revenue bond debt is issued at 4.2 percent interest rate).

25  **Q.    What is the net effect on allowed rate of return of your proposed adjustments?**

1   A.    My proposed adjustments would result in an allowed rate of return of 3.55%, where the

2         increase from 3.11% to 3.55% results from the additional cost of debt associated with the

3         assumed $25 million revenue bond issue.  This rate of return would result in a total return of

4         $11.93 million (3.55% * $336 million = $11.93 million) which would support over a

5         doubling of MWW's estimated 2014 annual interest expense to about $3.0 million, and still

6         provide a return on equity of about $9.03 million – an amount consistent with what would be

7         allowed a typical utility with a balanced capital structure at the proposed 5.38% rate of

8         return.  This approach to capital financing – greater reliance on debt in the near term - could

9         reduce near-term rate increases (for all parties) while still enabling MWW to reinvest in its

10        system.  All MWW ratepayers would benefit from this adjustment, which at the same time

11        provides for increased funding to MWW to make needed system investments.

12   **Q.**    **Does your imputed composite rate of return assume differential rates of return are**

13        **allowed for retail vs. wholesale service?**

14   A.    An imputed return may reflect a common return across customer classes or a differential.

15        The imputation addresses the atypical nature of MWW's capital structure, not the relatively

16        common attribute of MWW serving as a wholesale supplier.  For purposes of determining a

17        recommended return adjustment in this instance, no differential was assumed

18   **Q.**    **Do you believe that a rate of return differential should not be allowed for retail vs.**

19        **wholesale service in this case?**

20   A.    While it is common to recover higher rates of return for outside-City and wholesale

21        customers, the mere existence of precedent is not a sufficient basis for adoption.

22        Importantly, to sustain a cost-of-service based differential, we must look at the underlying

23        factors that might warrant a rate differential.  These are discussed in AWWA's *Principles of*

24        *Water Rates, Fees and Charges* (6th Edition), (Chapter V.1, pp. 157-172) and center on risks

1    associated with outside-City service.  Four risk factor categories are discussed including (1)

2    business risk; (2) interest rate risk, (3) financial risk, and liquidity risk.  Taking these risk

3    factors individually, it is noteworthy that risks imposed by wholesale customers are

4    exceptionally similar to those associated with retail service, if they prevail at all:

5    • Business risks relate to the potential for unplanned events that inhibit the utility's

6       ability to meet its financial obligations.  Among the most cited of these events is the

7       potential exit of a major customer (for whom capacity has been constructed and may

8       become effectively stranded).  In this context, it seems ironic that a return differential

9       is being requested from wholesale customers served under long-term contracts to

10      help pay, in part, expenses of a system now overbuilt due to the departure of major

11      retail customers.

12   • Interest rate risk relates to the potential for fluctuations in interest rates to have an

13      adverse impact on the utility's costs of debt and earnings on financial investments.

14      As discussed previously, MWW has more limited exposure to certain of these risks

15      as a consequence of its atypical capital structure.  With a limited debt portfolio,

16      interest rate risk associated with MWW's borrowings is inconsequential.  Similarly,

17      MWW does not hold sizeable cash balances and no operating reserves such that its

18      exposure to interest rate risk on fund balances is likewise limited.   More

19      fundamentally for the question of a rate of return differential, there is no apparent

20      difference in interest rate risk associated with retail vs. wholesale service.

21   • Financial risk is the risk that the utility will not have adequate cash-flows to meet its

22      obligations. Notably, the AWWA M1 Manual explains this risk in terms of outside-

23      City service as follows:

1    *By extending service outside the corporate boundaries, a*
2    *municipality typically requires a significant commitment of funds,*
3    ***normally financed by long-term debt****. With higher levels of debt, the*
4    *municipality is more heavily leveraged due to the cash-flow claims*
5    *associated with repayment of debt obligations... Finally, because*
6    *actual returns to the municipality are a residual value, that is, funds*
7    *available after paying all O& M and debt-service expenses, the*
8    *actual return received from nonowner consumers becomes more*
9    *uncertain as the ratio of debt to equity increases.*  (AWWA M1
10   Manual, p. 163)

11   As noted, MWW's debt equity ratio is exceptionally low – any financial risk

12   exposure has certainly not derived from its incurrence of debt to extend wholesale

13   service.

14   • Liquidity risk relates to the utility's ability to convert assets to cash or other

15      marketable securities to enable expenditures.  Yet again, with MWW's limited debt

16      portfolio, it is well positioned to establish a variety of forms of liquidity, its

17      commitments of funds to support wholesale service notwithstanding.

18   Accordingly, it must be recognized that the risk factors that may legitimately give rise to a

19   rate of return differential for wholesale service in other jurisdictions are nonexistent or

20   insignificant in this instance.

21   **Q.    Are similarities in risks associated with retail vs. wholesale customers the only reason**

22   **why MWW's proposed differential rates of return are unwarranted?**

23   A.    No.  MWW's near complete cash financing of long-lived infrastructure – violating principles

24      of intergenerational equity – has meant that all of MWW's customers, both wholesale and

25      retail, have paid rates that supported MWW's accrual of a disproportionately high amount of

26      equity relative to debt. To now impose differential rates of return to the resulting skewed rate

27      base both perpetuates and exacerbates the misalignment of capital funding, and would further

28      penalize wholesale customers who have contributed proportionately to the accumulation of

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| 1 | | equity that now insulates MWW from many of the risks that are typically associated with |
| 2 | | wholesale service. |
| 3 | Q. | **Does this conclude your testimony on MWW's proposed rate of return, including its** |
| 4 | | **proposed differential returns for wholesale vs. retail service?** |
| 5 | A. | Yes. |

<p align="center">**Public Fire Protection**</p>

| | | |
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| 7 | Q. | **Please summarize your testimony with respect to Public Fire Protection.** |
| 8 | A. | My testimony is limited to two primary points. First, I note that the allocation of fire |
| 9 | | protection costs for wholesale service at all diverges from my understanding of common |
| 10 | | practice nationally, particularly for major metropolitan communities (with existing excess |
| 11 | | capacity). Second, even under the dubious notion that MWW's wholesale customers should |
| 12 | | be allocated fire protection costs at all, the population-based demands used to allocate costs |
| 13 | | are inappropriate given the nature of wholesale service delivery. |
| 14 | Q. | **What is your understanding of common practice nationally for allocation of fire** |
| 15 | | **protection costs for systems with wholesale customers?** |
| 16 | A. | Practices rightly are tailored to the specific circumstances of individual utilities. It is |
| 17 | | important that cost allocations reflect cost causation of the particular systems delivering |
| 18 | | service. However, the very nature of wholesale service more typically results in these |
| 19 | | customers being excluded from the allocation of fire protection costs related to their |
| 20 | | acceptance of wholesale water supplies. Quite simply, this is because wholesale customers |
| 21 | | do not avail themselves of this service from their wholesale provider; they typically provide |
| 22 | | it themselves in their delivery of retail services. In this regard, it seems noteworthy that the |
| 23 | | AWWA M1 Manual's example cost allocations do not show allocations of fire protection |
| 24 | | costs for wholesale users but rather delineate how fire protection costs may be appropriately |

1    distributed across retail only customer classes.  (AWWA M1 Manual, pp.145-148)  This

2    more typical circumstance is also characteristic of other major metropolitan cities providing

3    wholesale services.  For example, Louisville Water Company, a utility with many similar

4    attributes to MWW including having considerable excess capacity, excludes fire protection

5    costs from its cost allocations to wholesale customers.

6            As stated in the AWWA M1 Manual:

7            *Fire protection service differs from other services provided by the utility.*
8            *Essentially, this is a standby service that the utility makes available on demand.*
9            *Although most fire hydrants and sprinklers connections are rarely used, the utility*
10           *must be ready to **provide adequate quantities and pressures** to meet fire fighting*
11           *needs at all times throughout the distribution system. (emphasis added)* (AWWA
12           M1 Manual, p. 141)

13   While MWW's cost of service analysis excludes wholesale customers from responsibility for

14   direct fire protection costs associated with, for example, hydrants, it does allocate maximum

15   day and maximum hour costs assigned to fire protection to wholesale customers.  This is

16   contrary to my understanding of common practice nationally.  Most of MWW's wholesale

17   customers have developed their own systems, with storage and internal transmission to meet

18   potential fire flow demands without imposing exceptional, standby type demands on MWW.

19   The utility-specific circumstances for MWW are such that most of MWW's wholesale

20   customers do not avail themselves of standby fire protection services from MWW.

21 **Q,   Under a theory whereby MWW's wholesale customers are to be allocated some fire**

22      **protection costs, do the MWW allocations properly do so?**

23 A.    No.  The demands assigned to MWW's wholesale customers employ population-based

24      methodologies (Freeman, NBFU, Kuickling) for estimation of fire flow demands –

25      effectively treating wholesale and retail customers equivalently for purposes of estimating

26      fire demands.  In doing so, MWW completely ignores the fact that all of MWW's wholesale

1    customers with the exception of Shorewood have storage facilities (or other supply sources)

2    that would be employed in the event of a fire.  If MWW's maximum-day or maximum-hour

3    capacity is needed at all during a fire behind a wholesale customer's master meter, it would

4    only be after that customer has drawn substantially from its own fire-related capacity (which

5    it is required to have in place).  This failure to recognize the fundamental differences

6    between retail and wholesale service violates allocation of costs on the basis of cost

7    causation, is contrary to industry-standard practice nationally, and inappropriately shifts fire

8    protection costs that arguably should be entirely borne by MWW's retail customers to

9    wholesale customers.

10   **Q.    Does this complete your testimony with respect to allocation of fire protection costs?**

11   A.    Yes.

12                                          **Summary**

13   **Q.    Can you summarize your testimony with regard to MWW's submitted COSS?**

14   A.    Yes. I have four major concerns. First, while I have been an ardent advocate for the use of

15         demand metering to develop more accurate customer demand factors, and co-authored the

16         AWWA M1 Manual's appendix on the Development of Peaking Factors by Customer Class,

17         the Customer Demand study submitted in this case fails to yield information suitable for use

18         in a cost-of-service analysis. Preservation of the status quo, perhaps regrettably, is preferable

19         to use of incomplete and non-representative data.  Second, I believe MWW's resurrection of

20         the diameter-inch mile basis for estimation of transmission vs. distribution costs, in the face

21         of actual cost information, to be wholly unwarranted.  Like the fundamentally flawed

22         Demand Study, it should be completely disregarded.  Third, I believe that MWW has, once

23         again, sought an inappropriate rate of return that – due to its atypical capital structure built

24         on the backs of wholesale and retail customers alike – will convey undue returns to the City

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| 1 | | of Milwaukee in absolute dollar terms. Further, I believe that MWW's risk profile which is |
| 2 | | not made materially more acute by virtue of its service to wholesale users cannot be |
| 3 | | reasonably ignored. Given this, a rate of return differential seems a dubious proposition. |
| 4 | | Finally, I believe that the allocation of fire protection costs to wholesale customers ignores |
| 5 | | basic principles of cost causation. MWW's wholesale customers with the exception of |
| 6 | | Shorewood have put in place facilities to enable them to meet fire flows without imposing |
| 7 | | acute demands on MWW. To ignore this reality, and particularly to apply population based |
| 8 | | fire flow demands that do not account for wholesale customers' storage facilities, violates |
| 9 | | fundamental principles of cost causation. |
| 10 | **Q.** | **Are the opinions you express in this testimony to a reasonable degree of professional** |
| 11 | | **certainty?** |
| 12 | A. | Yes. |
| 13 | **Q.** | **Does this conclude your pre-filed testimony?** |
| 14 | A. | Yes. |

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